Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

DRAFT
Title V, Construction / Operating
Permit: V-07-007
Augusta Fiberglass Coating, Inc.
Harrodsburg, KY 40330
February 27, 2007
Frough Sherwani, Reviewer

SOURCE ID:	021-167-00027
SOURCE A.I. #:	83749
ACTIVITY ID:	APE20070001

Source Description:

On February 6, 2007 the Division received an application from the source for the construction/operation of a temporary facility in Harrodsburg, Kentucky for the manufacturing of fiberglass reinforced plastic (FRP) stack liners. The FRP stack liner cans will be manufactured through a non-continuous sequence of winding, chopping, and hand lay-up processes involving fiberglass strand and a styrene-based, fire-retardant vinyl ester. The resin serves as the bonding matrix for the reinforcing glass in the chimney liners. The resin is diluted and stabilized with styrene (generally 41.5 to 46.5%). A catalyst, methyl-ethyl ketone peroxide (MEKP) is added to the resin at the point of contact with the glass reinforcement to "harden" the resin. The MEKP makes up approximately 2% of the resin mixture applied. During the resin hardening reaction process, the styrene is either consumed in the peroxide reaction or driven out of the mix during the exothermic cycle.

The process at the proposed facility begins as a release film is wrapped onto a spinning tool referred to as a mandrel, which can be installed in either a vertical or horizontal position. The mandrel is then wetted with resin from a non-atomized spray gun. Chopped fiberglass strand mat for corrosion barrier is applied, wet with resin, and rolled to consolidate the fiber and eliminate trapped air. When the liner is cured, the filament winding process is started. Filament winding involves the application of a thin layer of chopped fiberglass strand and resin followed immediately with a layer of continuous winding strands, which are wound onto the mandrel on top of and embedded into the chopped strand mat. During the winding process, fiberglass strand is pulled through a bath of resin and applied to the mandrel. During the chopping process, fiberglass strand is chopped and mixed with resin as it is sprayed simultaneously onto the spinning mandrel. The chopped strand and resin is applied from a mechanical, non-atomized spray gun (chopper gun). The winding continues until a full can is complete, at which point it is lifted free of the mandrel. During final assembly of the liners within the stack, resin is applied manually and smoothed with hand rollers to join each stack liner can.

Once manufactured, the stack liner cans will be transported to and installed within one new stack being constructed at the E.ON US (E.ON) E.W. Brown Generating Station (Brown Station) to handle the exhaust gas from a new flue-gas desulfurization system. The new facility will be constructed on an unused area of the E.ON's property. The 31-feet diameter stack liner (consisting of approximately 12 FRP cans) will be produced during the approximate 18-month span the facility will be in operation.

Styrene monomer is one of the main components of the resin used in the FRP stack liners

production process. As such, the hand lay-up operations, operation of the chopper gun, filament winding and use of the resin bath will result in the release of volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions. Additional VOC emissions will result from the use of a catalyst (e.g., methyl ethyl ketone peroxide [MEKP]) for the curing process and the use of solvents (e.g., methylene chloride) for cleaning. A resin storage tank will also be a small source of VOC and HAP emissions from breathing and working losses. An insignificant amount of PM, PM_{10}, NO_X, CO, SO_2 and HAP emissions will also result due to fuel combustion activities at the facility, such as a propane space heater.

Potential emissions of styrene, a hazardous air pollutant (HAP), from the new facility will exceed 10 tpy. Thus, the Augusta facility, which will be a separate stationary source from E.ON, will be classified as a major source under the Title V permit program.

Proposed Construction Project

The proposed facility will be located on Dix Dam Road, Harrodsburg, KY 40330. The FRP parts will be manufactured through a non-continuous sequence of winding, chopping, and hand lay-up processes involving fiberglass strand and a styrene-based resin. One temporary building (75' × 75') with an extension lean-to (30' × 50') will be constructed as part of the new operation to cover and protect the FRP process equipment. One winding station will be constructed inside the temporary building. The winding station will consist of a winding machine and mandrel, one chopper gun, and one resin bath. One 10,000-gallon double-walled resin storage tank to support FRP stack liner production will be installed outside the building, which will receive resin shipments by tanker truck. In addition, there will be one 1.0 million British thermal units per hour (MMBtu/hr) propane-fired space heater to provide comfort heat within the temporary buildings. The permittee will also utilize certain types of mobile equipment (e.g., fork lifts, man lifts, crane), which will have propane or diesel-fired internal combustion engines.

Comments:

Type of Control and Efficiency:

Pursuant to 40 CFR § 63.5805(c), the permittee shall comply with the work practice standards in Table 4 to 40 CFR 63 Subpart WWWW for the equipment cleaning, mixing, and HAP-material storage operations.

The work practice standards will be as follows:

- For the cleaning operations, the permittee shall not use cleaning solvents that contain HAP, except that styrene may be used as a cleaner in closed systems, and organic HAP containing cleaners may be used to clean cured resin from application equipment. Application equipment will include any equipment that directly contacts resin.
- For the HAP-containing materials storage operations, the permittee shall keep containers that store HAP-containing materials closed or covered except during the addition or removal of materials. Bulk HAP-containing materials storage tanks may be vented as necessary for safety.

- For the mixing operation, the permittee shall use mixer covers with no visible gaps present in

the mixers covers, except that gaps of up to 1 inch are permissible around mixer shafts and any required instrumentation. The permittee shall close any mixer vents when actual mixing is occurring, except that venting may be allowed during addition of materials, or as necessary prior to adding materials or opening the cover for safety. The permittee shall also keep the mixer covers closed while actual mixing is occurring except when adding materials or changing covers to the mixing heads. Containers of 5 gallons or less may be open when active mixing is taking place, or during periods when they are in process (i.e., they are actively being used to apply resin.

Emission Factors and Their Sources:

A resin containing styrene monomer and a catalyst containing MEKP will be utilized in the FRP production process. To determine the VOC and HAP PTE of the FRP production operations, maximum material throughput and the United Emission Factors (UEF) for manual resin application, filament winding, and mechanical resin application from the American Composites Manufacturers Association (ACMA) are used. The PTE calculations for the FRP stack liner production processes are based on the maximum possible styrene content of the resin (46.5% by weight) and the worst-case resin usage in a 12-month period. The HAP content for catalyst is based on the MSDS.

To determine the PTE of the space heater, the maximum design heat input capacity of the heater and emission factors for liquefied petroleum (LP)-gas combustion from Table 1-5.1 of AP-42 compilation document are used. Although the heater will only operate a portion of the year, annual emissions are calculated assuming 8,760 hours of operation per year.

The potential HAP and VOC emissions from the 10,000 gallon double walled resin storage tank are calculated using U.S. EPA TANKS 4.09d program conservatively assuming that the tank contains 100 percent styrene.

Potential emissions from the equipment cleanup operations are calculated assuming a 100 percent annual solvent evaporation rate and using the constituent properties of the representative solvent per the MSDS.

Emissions Description:

Pursuant to Table 3 to 40 CFR 63 Subpart WWWW, the permittee will comply with the following emission limits for the open molding operations:

Resin Application Technique	Organic HAP Emission Limit	Compliant Resin Organic HAP Content
Non-atomized Mechanical (Spray Gun)	113 lb/ton	46.5 %
Filament Winding (Resin Bath)	171 lb/ton	42.0 %
Manual (Hand Lay-up)	123 lb/ton	40.0 %

The permittee will comply with the above emissions limits using either of the options available in 40 CFR § 63.5810(a) through (c), which are stated as follows:

- For the individual resin applicable emission limit option, the permittee will calculate the actual organic HAP emissions factor for each different process stream within each operation type. The permittee will calculate organic HAP emissions factors for each different process stream by using the appropriate equations in Table 1 to Subpart WWWW.

- For the average HAP emission factor option, the permittee will demonstrate that on average the facility meets the individual organic HAP emissions limits for each unique combination of operation type and resin application method. The permittee will comply with the procedures specified in 40 CFR § 63.5810(b) to comply with the emission limitations and demonstrate that the average organic HAP emission factor will be less than the corresponding emission limit.

For the weighted average emission limit option, the permittee will demonstrate for all open molding operations each month that the facility meets each weighted average of the organic HAP emissions limits in Table 3 to Subpart WWWW. The permittee will calculate the weighted average organic HAP emissions limit and weighted average organic HAP emissions factor for all open molding operations for the last 12-month period using the procedures specified in 40 CFR 63.5810(c)(1) and (2) and demonstrate that the 12-month rolling average HAP emissions factor is less than or equal to the corresponding 12-month rolling average HAP emissions limit.

Applicable Regulations:

- 40 CFR 63 Subpart WWWW, Emission Standards for Hazardous Air Pollutants for Fiberglass Reinforced Plastics Production

The permittee will comply with the organic HAP emission limits in Table 3 of 40 CFR 63 Subpart WWWW for the open molding operations. As stated above, the source will also comply with the work practice standards in Table 4 of Subpart WWWW for the cleaning, storage and mixing operations.

Precluded Regulations :

- *40 CFR 64, Compliance Assurance Monitoring.* No emission units at the proposed facility have potential pre-control device emissions of a regulated air pollutant equal or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.
- *40 CFR 63 Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines (RICE).* This rule does not apply since all the internal combustion engine will be classified as mobile RICE.
- *40 CFR 60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels.* This rule does not apply to the resin storage tank, having a capacity of 10,000 gallons, because the capacity of the storage tank is less than the applicability threshold (19,812.9 gallons).
- *401 KAR 59:015, New Indirect Heat Exchangers.* The space heater is not an indirect heat exchanger and this unit will be exempt from this rule.

Periodic Monitoring:

Pursuant to 40 CFR § 63.5895(c), the permittee will collect and keep records of resin usage, organic HAP content, and operations where the resin is used. Resin usage records will be based on purchase records and the organic HAP content records will be based on MSDS or on resin specifications supplied by the resin supplier. Resin usage records will not be required for the individual resins and gel coats that are demonstrated, as applied, to meet their applicable emission limits. If the compliance is initially demonstrated with the applicable emission limits using a specific combination of an individual resin and application method, and the resin or application method changes or the organic HAP content increases, then the permittee shall again demonstrate that the individual resin meets its emission limit as specified in 40 CFR § 63.5810(a).

The permittee shall perform continuous monitoring of the cleaning, mixing and HAP-containing material storage operations to comply with the work practice standards specified in Table 4 of 40 CFR 63 Subpart WWWW.

Credible Evidence:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.